
NCC-TET

National Coordinating Committee on Technology in Education and Training (NCC-TET) *continued...*

National Association of State Boards of Education
National Association of State Directors, VoTech Education
National Catholic Educational Association
National Center on Education and the Economy
National Council for Accreditation of Teacher Education
National Council for Social Studies
National Council of Teachers of English
National Council of Teachers of Mathematics
National Education Association
National Foundation for the Improvement of Education
National Home Study Council
National School Boards Association
National Security Industrial Association
National Technological University
Office of U.S. Representative William F. Goodling
Offices of U.S. Senators Edward M. Kennedy, Jeff Bingaman, and Thad Cochran
Organizations Concerned about Rural Education
Private Sector Council
Public Broadcasting Service Online
Public Broadcasting Service
Quality Education Data
Regional Bell Telephone Companies
Society for Applied Learning Technology
Software Publishers Association
Technology Student Association
The Mecklenburger Group
The National PTA
Triangle Coalition for Science and Technology Education
U.S. Distance Learning Association

Observers:

Advanced Research Projects Agency
California State University System
Fairfax County Schools
National Aeronautics and Space Administration
National Education Goals Panel
National Oceanic and Atmospheric Administration
National Science Foundation
Office of Educational Research and Improvement, U.S. Department of Education
Office of Science and Technology Policy, Executive Office of the President
Office of Technology Assessment, U.S. Congress
Office of the Deputy Secretary, U.S. Department of Education
Office of the Director, Federal Communications Commission
U.S. Army Research Institute

APPENDIX J

IMPLEMENTATION COSTS

The most comprehensive summary of implementation costs that we have seen is found in the McKinsey Report, which estimates that startup costs for the Classroom Model would be approximately \$47 billion over five years (not including video and voice infrastructure costs), with on-going costs of \$14 billion. As noted in the text of our comments, however, we do not propose that hardware and associated software and training costs be included as special services, so the McKinsey Report's overall figure is much too high. The McKinsey Report's estimates of initial costs for connections to schools and connections within schools are \$1.6 billion and \$6.3 billion respectively, over five years. Ongoing costs would be about \$1.6 billion per year. In reality, we believe the cost of installing connections to and within each school and could well be much lower. In addition, use of fiber optics to provide broadband capacity would cost no more than copper T-1 lines, and possibly less. Installation of fiber optic cable would make the additional cost of video and voice infrastructure under the McKinsey approach essentially zero, if we assume that schools and libraries would provide their own terminal equipment. See McKinsey Report at Appendix A.

Finally, the Kickstart Report estimates the costs of connecting public libraries at about \$0.3 billion, with about \$0.15 billion in on-going costs per year. See Kickstart Report at p. 96.

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APPENDIX K

FUNCTIONALITIES REQUIRED BY SCHOOLS AND LIBRARIES

A review of the existing uses to which schools and libraries are putting technology indicates that the following functionalities should be included in the definition of special services:

- o *Broadband links beyond the school system:* Kansas, North Carolina, Iowa and other states are already providing state fiber optic networks linking school districts and individual schools. Separate networks will not be required if individual schools and districts have adequate connections through local carriers. Some schools -- about 7% -- have T-1 links to the public switched network; about 3% have ISDN service. T-1 connections, however, are not adequate to support some of the functions described below, and are not state-of-the-art given the availability of fiber networks in many areas. ISDN service over existing phone lines also would not support some functions. Both types of service may be sufficient to meet many institutions' needs over the short and mid-term, but the Commission should not adopt a standard that will soon prove inadequate for a significant number of schools and libraries.
- o *District level broadband wide area networks:* Port Neches, Texas has linked its schools with an optical fiber WAN. Guilford County, North Carolina has connected all of its high schools using OC-3c fiber connections via SONET to a public ATM switch. Another example is Glendale Union High School District in Arizona. Nationally, 75% of schools currently have some form of access to WAN's or LAN's.
- o *School-level local area networks:* Mendocino, California and Champlain Valley Union High School, Vermont are just two of the many examples. Ethernet technology is used in both districts, as in many others, but should not be denominated a national standard.
- o *Videoconferencing and distance learning capability:* Guilford County has two-way interactive video/audio connections. Glendale Union High School District also uses fiber optics to deliver instructional television capability to each school. The capacity requirements discussed above should be large enough to provide this capability to a media center in each school.
- o *Access to Interactive Multimedia Networks:* Stuyvesant High School in New York City is one school that has this capability, which is one of the near term objectives of the executive branch.

- o *Internet access:* 50% percent of all schools, but only 9% of all instructional rooms, and 68% of public libraries currently have Internet access in some form. All classrooms, school libraries and public libraries should have this capability, including the capacity to reach on-line service providers. We note that AT&T's Learning Network makes this capability available to selected schools at no charge or discounted rates.
- o *E-mail:* Teachers and parents should have the capability to reach each other by e-mail, and students should have the ability to interact with students in other schools as well. Mendocino, California, and the Ysleta Independent School District in El Paso, Texas, are two of many districts with this capability. E-mail access is now a basic form of communication and should be available in all classrooms.
- o *School Bulletin Boards:* Electronic bulletin boards improve communications by allowing schools to post announcements and teachers to post homework assignments. They can be reached by students and parents at home, in libraries, and in community centers and other access points. The Ysleta Independent School District has implemented such a system with great success.
- o *Voice mail:* Just as e-mail is becoming ubiquitous, so is voice mail. Voice mail capability in the schools will improve communications between parents and teachers, and make it easier for schools to contact families with announcements and information. AT&T already provides this service to some schools at discounted rates as part of its Learning Network.
- o *Telephone service in classrooms:* Only 12% of classrooms have any telephone service at all. Some school districts find it unnecessary, but all should have the capability if they desire it.